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| 10/797,515 | 03/10/2004 | Steve Naroff | 772.025US1 | 4252 |

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| 21186    7590    03/28/2007 | | EXAMINER | |
| SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. | | NGUYEN, PHILLIP H | |
| P.O. BOX 2938 | | ART UNIT | PAPER NUMBER |
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| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 03/28/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>01 February 2007</u>.

2a)☐ This action is **FINAL**.     2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) <u>1-51</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-51</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>01 February 2007</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All    b)☐ Some * c)☐ None of:

　　　　1.☐ Certified copies of the priority documents have been received.

　　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

## DETAILED ACTION

1.      This action is responsive to amendment filed on February 01, 2007.

2.      Per Applicant is requested claims 21, 30, 36, and 41 have been amended.

3.      Claims 1-51 remain pending.

### *Specification*

4.      The amendment filed on February 1, 2007 overcomes the objection to pages 10

and 16 of previous action.  Therefore, the objection is withdrawn.

### *Claim Rejections - 35 USC § 101*

5.      The amendment filed on February 1, 2007 overcomes the 35 USC § 101 non-

statutory rejections to claims 30-45 for covering signals of the previous action.

Therefore, the rejection is withdrawn.

### *Claim Rejections - 35 USC § 112*

6.      The amendment filed on February 1, 2007 overcomes the 35 USC § 112

rejection for containing the trademark or trade name to claims 1, 8, and 9 of previous

action.  Therefore, the rejection is withdrawn.

7.      Regarding claim 46, recites an apparatus but the perform the steps of method

without any hardware components.  It is unclear to Examiner as to whether Applicant is

claiming a method or an apparatus. Applicant is required to amend the claim to recite

either a method or adding hardware components into the said apparatus.

## *Response to Arguments*

8.     Applicant's arguments with respect to claims 1-51 have been considered but are

moot in view of the new ground(s) of rejection.

## *Claim Rejections - 35 USC § 102*

9.     The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10.     Claims 1, 2, 4-8, 17, 21, 22, 24-26, 30, 31, 33-37, 39, 46, 47, and 49-51 are

rejected under 35 U.S.C. 102(b) as being anticipated by Szoke (United States Patent

No.: 4,787,034).

As per claims 1, 30, and 46:

> Szoke discloses:
>
> -     loading a first set of instructions into an execution unit (**see at least FIG. 1,**
>
>     **"program P11"**), wherein the first set of instructions includes an unresolved
>
>     reference to a second set of instructions (**"CALL P21"** or **"CALL P24"**),
>
>     wherein the loading includes replacing the unresolved reference with an

address of a third set of instructions ("**when the statement CALL 'P21' in
program P11 is executed, control is passed to the statement at entry
point P21 in E-Table 120, i.e., to branch statement 122. Branch
statement 122 causes a branch to linkage program 130**" col. 4, line 3-7,
**also see at least FIG. 1**);

- executing instructions of the first set ("**when the statement CALL 'P21' in
program P11 is executed**" col. 4, line 3-4);

- executing instructions of the third set ("**Branch statement 122 causes a
branch to linkage program 130**" col. 4, line 6-7), wherein executing
instructions of the third set includes loading the second set of instructions into
the execution unit ("**when load module 200 is loaded by linkage program
130 of module 100**" col. 4, line 25-26); and

- executing instructions of the second set ("**linkage program 130 transfers
control to the actual address of program P21 in load module 200.
Program P21 CALLs programs P22 and P23, and then returns to
program P11**" col. 4, line 45-48).


As per claims 2, 22, 31, and 47:

Szoke discloses:

- wherein the first set of instructions includes an executable object module
("**load module 100 (LM-1)**" col. 2, line 53-54, **also see at least FIG. 1**).

As per claims 4, 24, 34, and 49:

Szoke discloses:

- wherein the second set of instructions includes a separately compiled object

    module ("**load module 200 (LM-2)**" col. 2, line 54, **also see at least FIG. 1**).

As per claims 5, 25, 35, and 50:

Szoke discloses:

- wherein the third set of instructions includes a loader unit ("**linkage program**

    **130**" col. 4, line 7, **also see at least FIG. 1**).

As per claims 6, 33, and 51:

Szoke discloses:

- wherein the loading does not include determining whether the unresolved

    reference refers to a defined external symbol ("**linkage program 130**

    **determines the address of T-table 260 from the load address of load**

    **module 200 supplied by the operating system**" col. 4, line 17-19,

    **therefore, Szoke does not determining whether the unresolved**

    **reference refers to a defined external symbol**).

As per claims 7 and 36:

Szoke discloses:

- compiling a source code module into an executable object module that
  includes an unresolved reference to a separately compiled object module
  ("**the compiler has no way to determine the address of the callable
  program, the compiler lists the callable program as an unresolved
  external reference**" col. 1, line 38-40);

- loading the executable object module (**see at least FIG. 1, "program P11"**),
  wherein the loading includes replacing the unresolved reference with a
  reference to a system module ("**when the statement CALL 'P21' in
  program P11 is executed, control is passed to the statement at entry
  point P21 in E-Table 120, i.e., to branch statement 122. Branch
  statement 122 causes a branch to linkage program 130**" col. 4, line 3-7,
  **also see at least FIG. 1**), and wherein neither the compiling nor the loading
  include determining whether the unresolved reference refers to a defined
  external symbol ("**linkage program 130 determines the address of T-table
  260 from the load address of load module 200 supplied by the operating
  system**" col. 4, line 17-19, **therefore, Szoke does not determining whether
  the unresolved reference refers to a defined external symbol**);

- executing the executable object module, wherein the executing includes,
  calling the system module for loading the separately compiled object module

("**when load module 100 is created (executed). Therefore, when the**

**statement CALL 'P21' in program P11 is executed**" col. 4, line 2-4); and

- executing the separately compiled object module ("**linkage program 130**

  **transfers control to the actual address of program P21 in load module**

  **200. Program P21 CALLs programs P22 and P23, and then returns to**

  **program P11**" col. 4, line 45-48).

As per claims 8 and 39:

Szoke discloses:

- wherein the system module includes a loader unit ("**linkage program 130**"

  col. 4, line 7).

As per claim 17:

Szoke discloses an apparatus comprising:

- a compiler unit to create an executable object module based on a source

  code module ("**compiler**" col. 1, line 38), wherein the executable object

  module includes an unresolved reference to a separately compiled object

  module ("**the compiler lists the callable program as an unresolved**

  **external reference**" col. 1, line 39-41);

- a storage unit to store the executable object module ("**storage space**" col. 1,

  line 65);

- an execution unit to receive the executable object module ("**linkage editor**" col. 3, line 9); and

- a loader unit to find the executable object module in the storage unit and present the executable object module to the execution unit ("**linkage program 130 causes the operating system to load the load module identified by literal constant 123, i.e., load module 200**" col. 4, line 7-10), wherein the loader unit is to replace the unresolved reference with a reference to a system module ("**when load module 200 has been loaded, the operating system will return the load address of load module 200 to linkage program 130**" col. 4, line 10-12), and wherein the loader unit is not to determine whether the unresolved reference refers to a defined external object module ("**linkage program 130 determines the address of T-table 260 from the load address of load module 200 supplied by the operating system**" col. 4, line 17-19, **therefore, Szoke does not determining whether the unresolved reference refers to a defined external symbol**).

As per claim 21:

- a loader unit to load a first set of instructions into a memory unit ("**load module 100 (LM-1)**", col. 2, line 53-54, **this means, the module is already loaded in memory**), wherein the first set of instructions includes an unresolved reference to a second set of instructions ("**when load module 100 is created the statements CALL 'P21' in program P11 and CALL**

**'P24' in program P12 would not ordinarily be resolved, and would**

**instead be listed as unresolved external references**" col. 3, line 5-10), the

loader unit to replace the unresolved reference with an address of a third set

of instructions ("**when load module 200 has been loaded, the operating**

**system will return the load address of load module 200 to linkage**

**program 130**" col. 4, line 10-12); and

- an execution unit to execute instructions of the first set ("**when load module**

**100 is created (executed)**" col. 4, line 2), the execution unit also to execute

instructions of the third set to determine an address of the second set of

instructions ("**Branch statement 122 causes a branch to linkage program**

**130**" col. 4, line 6-7), wherein the loader unit is to use the address of the

second set of instructions to load the second set of instructions into the

memory unit ("**when load module 200 is loaded by linkage program 130 of**

**load module 100, these relative addresses are converted to the actual**

**loaded addresses of program P21 and P24 respectively**" col. 4, line 25-

28).

As per claim 26:

Szoke discloses a system comprising:

- a memory unit, the memory unit including, a compiler unit to create an

executable object module based on a source code module, wherein the

executable object module includes a symbolic reference to a separately

compiled object module ("**when load module 100 is created the statements CALL 'P21' in program P11 and CALL 'P24' in program P12 would not ordinarily be resolved, and would instead be listed as unresolved external references**" col. 3, line 5-10);

-   a loader unit to present the executable object module for execution, wherein the loader unit is to replace the symbolic reference with an address to a system module ("**when load module 200 has been loaded, the operating system will return the load address of load module 200 to linkage program 130**" col. 4, line 10-12), and wherein the loader unit is not to determine whether the symbolic reference refers to a defined external object module ("**linkage program 130 determines the address of T-table 260 from the load address of load module 200 supplied by the operating system**" col. 4, line 17-19, **therefore, Szoke does not determining whether the unresolved reference refers to a defined external symbol**); and

-   a processor to receive the executable object module from the loader unit of the memory unit (**it is inherent in order to process the load modules**).

As per claim 37:

Szoke discloses:

-   wherein the determining the address includes looking-up the address in a master symbol table ("**linkage program 130 determines the address of T-**

**table 260 from the load address of load module 200 supplied by the**

**operating system"** col. 4, line 17-19).

### *Claim Rejections - 35 USC § 103*

11.    The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12.    .  Claims 9, 14, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Szoke (United States Patent No.: 4,787,034).

As per claims 9, 14, 43:

Szoke does not explicitly discloses:

-    wherein the loader unit is a dyld loader.

However, it would have been obvious to one having an ordinary skill in the art at

the time the invention was made to recognize that linkage program 130 is performed

dynamically ("**the CALLs to programs P21 and P24 to be resolved dynamically at**

**the time that load module 100 is executed**" col. 3, line 11-13).  Therefore, one of

ordinary skill in the art would have been motivated to use dyld loader because it is also

dynamic loader and available from Apple Computer, Inc.

13.    Claims 3, 11, 13, 19, 23, 28, 32, 40, 42, and 48 are rejected under 35 U.S.C.

103(a) as being unpatentable over Szoke (United States Patent No.: 4,787,034), in view

of "Apple Developer Connection" Apple Computer Inc. 2001.


As per claims 3, 11, 13, 19, 23, 28, 32, 40, 42, 48:

Szoke does not explicitly disclose:

-    wherein the executable object module is in the Mach-O object format.

However, Apple Developer Connection 2001 discloses the use of Mach-O file

format.  It would have been obvious to one having an ordinary skill in the art at the time

the invention was made to recognize that Mach-O is a well know file format in the art for

executable object code and use it in Szoke's approach for storing executable object

code.

Therefore, one would have been motivated to use Mach-O file format because it

provides both intermediate and final storage of machine code and data.  It was

designed as a flexible replacement for the BSD a.out format to be used by the compiler.


Claim 10, 18, 20, 27, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Szoke (United States Patent No.: 4,787,034), in view of Tatge et al. (United States

Patent No.: 5,293,630).


As per claims 10, 18, 20, 27, 29, 38:

Szoke does not explicitly disclose:

- wherein the source code module includes instructions of a dialect of the C
  programming language.

However, Tatge discloses an analogous method of returning a data structure from a callee function to a caller function fro the C programming language (col. 2, line 65). It would have been obvious to one having an ordinary skill in the art at the time the invention was made to recognize that in Szoke's approach, a compiler lists the external call as unresolved external references (see at least col. 1, line 39-40). Every high-level programming language comes with a compiler.

Therefore, one of ordinary skill in the art would have been motivated to apply Szoke's approach to C programming language as disclose in Tatge's approach because C is one of the high level programming languages.


Claims 12, 15, 16, 41, 44, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Szoke (United States Patent No.: 4,787,034), in view of Sexton et al. (United States Patent No.: US 6,434,685).


<u>As per claims 12 and 41</u>:

Szoke discloses:

- creating an executable object module that includes symbolic references to
  addresses in ones of a set of one or more separately compiled object
  modules (**see at least FIG. 1, "load module 100 (LM-1)" and "program
  P11"**);

- replacing the symbolic references with addresses to a loader subroutine (see at least FIG. 1, "**CALL 'P21' or CALL 'P24'**");

- executing the executable object module ("**when load module 100 is created (executed)**" col. 4, line 2), wherein executing includes, executing the loader subroutine to load one of the separately compiled object modules ("**when the statement CALL 'P21' in program P11 is thereafter executed, control is passed to the statement at entry point P21 in E-table 120**" col. 4, line 3-5); and

- executing the one of the separately compiled object modules ("**linkage program 130 transfers control to the actual address of program P21 in load module 200. Program P21 CALLs programs P22 and P23, and then returns to program P11**" col. 4, line 45-48).

Szoke does not explicitly disclose:

- wherein the executable object module includes a page-aligned code segment and a page-aligned data segment, and wherein the object module includes resolved internal code-to-data offsets.

However, Sexton discloses a method for paged memory management system within a runtime environment that solves the page-aligned problem. It would have been obvious to one having an ordinary skill in the art at the time the invention was made to combine Sexton's approach with Szoke to improve the performance. The combination is obvious because one of ordinary skill would have motivated to save memory and improve the performance of page associated memory management operation by

perform page-aligned code segment and a page-aligned data segment (see in Sexton

at least col. 12, line 1-8).


As per claims 15 and 44:

Szoke discloses:

-   wherein the unresolved reference is a reference is a function call to a function

    included in one of the separately compiled object modules of the set

    ("**Program P11 includes statements that CALL programs P21**" col. 2, line

    63-64).


As per claims 16 and 45:

Szoke does not explicitly disclose:

-   wherein the unresolved reference is a reference to a variable defined within

    one of the separately compiled objects of the set.

However, it would have been obvious to one having an ordinary skill in the art at

the time the invention was made to recognize that calls to program P21 or P24 is also

including calls to variables within program P21 or P24 of module 200. One of ordinary

skill in the art would have been motivated to call to variables within P21 or P24 of

module 200 because calling external variables are also considered as external

unresolved references that need to be resolved dynamically at the time the module 100

is executed.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip H. Nguyen whose telephone number is (571) 270-1070. The examiner can normally be reached on Monday - Thursday 10:00 AM - 3:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Y. Zhen can be reached on (571) 272-3708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

WEI ZHEN
SUPERVISORY PATENT EXAMINER

PN
03/19/2007